REMARKS

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 are pending and under consideration.

I.   AMENDMENTS TO THE CLAIMS

Method claims 14, 17, 20 and 22 have each been amended to recite "using a suitably programmed computer" in connection with steps of the methods. Support for the amendments for performing the steps "using a suitably programmed computer" is found in Figures 1 and 2, and in the text in the specification discussing Figures 1 and 2 such as on, for instance, page 7, lines 21-24 (explaining that Figure 1 illustrates a computer system and Figure 2 illustrates processing steps), page 10, line 22, to page 11, line 33 (providing, for instance, that the exemplary computer system of Figure 1 implements the operations of steps diagrammed in Figure 2), page 16, line 5 (providing that the genotypic data structure is established using a computer), page 23, lines 16-20 (providing for forming a correlation value using a computer), page 26, lines 17-24 (providing for repeating the establishing and determining a correlation value using a computer), page 28, lines 8-11 (providing for selecting or identifying the genotypic data structures with the highest correlation values using a computer).

Claims 14, 17, 20, 22, 39, 42, 45, 47, 58 have been amended to recite in pertinent parts "said phenotype" for consistency with the antecedent "a phenotype." The phrase "each respective genotypic data structure in said plurality of genotypic data structures comprises a plurality of elements and . . ." has been added to claim 14 to provide antecedent basis for "each element" recited later in the claim.

Applicants respectfully submit that the claim amendments are fully supported by the specification and claims as originally filed. No new matter is introduced with these amendments. Entry of the claim amendments is respectfully requested.

No claim amendment fee is believed to be due with these amendments.

II.   INTERVIEW SUMMARY

Applicants thank Examiner DeJong for the courtesies extended during the telephonic interview on August 18, 2009, in which Examiner DeJong and Applicants' representatives Brett Lovejoy and Roger Rich participated. The rejection of the pending claims under 35 U.S.C. § 101 was discussed. The Examiner suggested that Applicants consider applying the

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element "using a suitably programmed computer" to all steps of the claimed methods. Applicants have amended method claims 14, 17, 20 and 22 as suggested by the Examiner.

III.   CLAIM REJECTION UNDER 35 U.S.C. § 101

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 stand rejected under 35 U.S.C. § 101 as being directed to nonstatutory subject matter. Applicants respectfully traverse the rejection.

The Legal Standard

The present governing test for determining subject matter eligibility of a process under § 101 is "machine-or-transformation test." *See In re Bilski*, 88 U.S.P.Q.2d 1385, 1393 (Fed. Cir. 2008). "The machine-or-transformation test is a two branched inquiry; an applicant may show that a process claim satisfies § 101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article." *See Bilski* at 1396. *Bilski* also explains that the prior decision of *In re Abele*, 214 U.S.P.Q. 682 (CCPA 1982) exemplifies that transformation of electronic data representing physical and tangible objects can render a process patent eligible. *See Bilski* at 1397. *Bilski* states that "[s]o long as the claimed process is limited to a practical application of a fundamental principle to transform specific data, and the claim is limited to a visual depiction that represents specific physical objects or substances, there is no danger that the scope of the claim would wholly pre-empt all uses of the principle." *See Bilski* at 1397.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 Satisfy the Machine Prong of the *Bilski* Machine-or-Transformation Test.

Each of claims 14, 15, 17 and 20-22 recites, or depends from a claim that recites, a method that requires determining a correlation value for said genotypic data structure by a comparison of said phenotypic data structure with said genotypic data structure using a suitably programmed computer. Those skilled in the art will understand that in order for the computer to perform the recited step of determining the correlation value, the genotypic data structure and phenotypic data structure must be tied to the suitably programmed computer. For instance, the exemplary computer system provided in the specification to implement a method, such as recited in claim 14, indicates that the data structures will be in memory (38). *See* Specification, page 10 and Figure 1. That the genotypic data structure and phenotypic

data structure represent real-life physical objects of different strains of a species and resides in the computer memory ensures that the method is tied to a particular machine or apparatus.

For example, the instant method claims are clearly distinguishable from the claimed method found not patent eligible under § 101 by the Board of Patent Appeals and Interferences in *Ex parte Cornea-Hasegan*, Appeal 2008-4742 (decided January 13, 2009), a decision cited by the Examiner in the Office Action dated April 29, 2009, for the present application. The rejected method claim in *Cornea-Hasegan* was directed to predicting results of floating point mathematical operations. The processor performing the recited method normalized operands for a floating point operation. The operands did not represent any physical and tangible objects and were not tied to any particular machine or apparatus because the floating point operation was applicable to any numbers. In contrast, the methods of the instant application can only be performed on a suitably programmed computer that can determine a correlation value using the recited genotypic data structures which represent chromosomal regions. Thus, method claims 14, 15, 17 and 20-22 are, in fact, tied to a particular machine or apparatus.

Instant claims 39, 40, 42, 45, 47 and 58 are directed to computer program products or computer systems. The claims recite physical elements, thus the recited subject matter does not encompass non-statutory subject matter such as signals. For this reason alone, consistency with post-*Bilski* decisions such as *Ex parte Mazzara* and *Ex parte Li* requires that claims 39, 40, 42, 45, 47 and 58 be considered patentable under § 101. *See Ex parte Mazzara*, Appeal 2008-4741 (BPAI, February 5, 2009) (finding a computer usable medium for storing an alert message in a mobile vehicle communication system to be patent eligible); *Ex parte Li*, Appeal 2008-1213 (BPAI November 6, 2008) (finding a computer program product to generate a report to be patent eligible). Moreover, genotypic data structures and phenotypic data structures recited in claims 39, 40, 42, 45, 47 and 58 represent physical and tangible objects of different strains of a species and are comprised within the physical elements, which ties the recited subject to a particular machine or apparatus.

Accordingly, claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 meet the machine prong of the *Bilski* machine-or-transformation test.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 Satisfy the Transformation Prong of the *Bilski* Machine-or-Transformation Test.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 specify methods, *inter alia*, in which a data set (genotypic data structure) representing chromosomal regions (a physical object) is transformed into a data set (transformed genotypic data structure) representing those chromosomal regions associated with a phenotype of a species. The transformed genotypic data structure is communicated to a user, a display, a readily accessible computer memory or other computer on a network. Because the genotypic data structures represent physical objects, the transformation in the recited methods, or implemented in the computer program products or computer system, confers subject matter patent eligibility under § 101. *See In re Bilski*, 88 U.S.P.Q.2d 1385, 1397 (Fed. Cir. 2008) (stating that "[w]e further note for clarity that the electronic transformation of the data itself into a visual depiction in *Abele* was sufficient; the claim was not required to involve any transformation of the underlying physical object that the data represented.") *See In re Bilski*, 88 U.S.P.Q.2d 1385, 1397 (Fed. Cir. 2008) (emphasis added). Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58, therefore, meet the transformation prong of the *Bilski* machine-or-transformation test.

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 Are Directed to a Practical Application

Claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 specify methods, *inter alia*, directed to a practical application. *See In re Bilski*, 88 U.S.P.Q.2d 1385, 1397 (Fed. Cir. 2008) (stating that a patent eligibility of a claimed process under § 101 requires that the process be limited to a practical application). In particular, those skilled in the art will recognize that the instant claims are important practical applications for associating a phenotype with one or more candidate chromosomal regions in the genome of an organism. This is supported, for instance, by the publication in the peer-reviewed journal *Science* of an article co-authored by the named inventors of the present application of their work substantially related to that recited in the instant claims. *See* Grupe *et al.*, 2003, "In Silico Mapping of Complex Disease-Related Traits in Mice," *Science*, volume 292, pages 1915-1918 (of record).

For the reasons set forth above, Applicants respectfully request that the rejection of claims 14, 15, 17, 20-22, 39, 40, 42, 45, 47 and 58 under 35 U.S.C. § 101 be withdrawn.
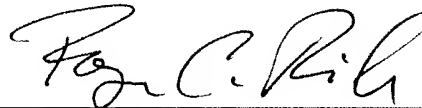
CONCLUSION

Applicants respectfully submit that the subject application is in good and proper order for allowance.

No fees, other than those for the accompanying Petition For Extension of Time Under 37 C.F.R. § 1.136(a), are believed to be due. However, if any fees are due in connection with this submission, please charge the required fees to Jones Day Deposit Account No. 50-3013 (order no. 800935-999015).

Respectfully submitted,

Date: _____August 27, 2009_____   _____   ___54,398___

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